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(54) **MACHINE FOR THE FABRICATION OF CONTAINERS WITH CONSUMABLE CONTENT**

MASCHINE ZUM HERSTELLEN UND BEFÜLLEN VON BEHÄLTERN

MACHINE A FABRIQUER DES EMBALLAGES RENFERMANT UN CONTENU CONSOMMABLE

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(56) References cited:
US-A- 3 659 993
US-A- 3 808 772
US-A- 3 837 782
US-A- 3 918 237

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Description

OBJECT OF THE INVENTION

[0001] The present specification refers to a machine for manufacturing containers with a consumable content, whose evident purpose is based on permitting the mass production of containers subsequently filled with a consumable product, such as infusions, medicines, etc., subsequently sealing the container previously filled with the consumable product.

FIELD OF THE INVENTION

[0002] This invention is applicable within the industry dedicated to manufacturing containers, specifically within the industry dedicated to manufacturing machines for manufacturing containers, which in turn fill the container made with the content and subsequently hermetically seal it.

BACKGROUND OF THE INVENTION

[0003] By US patent 3,808,772, a machine is known that is intended for manufacturing and filling combined containers, which, upon operating on a band of thermoplastic material in constant movement, the machine, which incorporates stations intended to heat the band, molds the band within the connected containers, filling the containers, covering and sealing the full containers and subsequently separating them successively.

[0004] The band is held on the edges thereof, and is mobilized from a roller.

[0005] The synchronization driving means cyclically move the heating, molding of the container and the apparatus that cuts in the direction of the movement of the band and the adjustment thereof.

[0006] The filling nozzles move with the recently formed containers while they are filled.

[0007] By US patent 3,387,782, a packaging machine is known for individual portions, wherein a thermoplastic film is automatically held, such that it can be released along its marginal portions, which longitudinally extend.

[0008] The film is moved forward and is progressively heated by means of a heater and is stretched in a direction that is transversal to its movement while it softens.

[0009] After leaving the heater and while still being held, the previously softened film is placed on the upper mold shapes adopting the shape of a cup in a mold station, and which is upwardly moved on one of its ends by a continuous line of said shapes, until reaching a filling and sealing station successively separated from said end.

[0010] By US patent 3,918,237, a machine is known for manufacturing containers that are similar to boxes, wherein a first continuous band of foldable material comes out of a feed roller and is folded to establish a series of "U"-shaped connected sections which are collected in the mold, and wherein a second continuous band of a foldable material coming out of a feed roller is folded into a "U"-shaped form and is joined to the series of sections which, also adopting the "U" shape, are established by the first band, such that the wall structure of the container is completed.

[0011] Accordingly, it can be established that the three recovered documents do not incorporate features that are similar to the object of the invention, although they are obviously within the same field of application, in other words they are intended to make containers.

[0012] Subsequently, the applicant does not know the existence of an invention which, applicable to the same purpose, has a faster manufacturing process, that is able to simultaneously generate numerous containers, and which the latter are at the same time of different varieties, being able to construct them due to the incorporation of the pertinent molding and cutting dies forming part of the machine.

DESCRIPTION OF THE INVENTION

[0013] The machine for manufacturing containers with a consumable content proposed by the invention is formed as an evident novelty within its structural unit, since it brings together into a single invention the package forming processes, filling the previously formed container with the consumable content, as well as sealing and die-cutting the previously manufactured and filled container, this action being carried out in a continuous and synchronized regimen.

[0014] More specifically, the machine for manufacturing containers with a consumable content object of the invention is constituted as from a frame, chassis or structure in which four modules are housed, two of these modules being intended for proportionally feeding the raw material for forming the container in two halves and separately, having the suitable means for carrying out said formation by heat and pressing, having at the same time dosing module containing the consumable product and the means for dosing and pouring it into one of the halves of the container produced, lastly having a cutting module with the suitable means for carrying out the seal by means of welding the two halves, as well as the final package die-cutting.

[0015] The raw material used to form the container is fed by said two feed modules, it may be a thermoplastic, which can be presented in the form of coils with a variable band width.

DESCRIPTION OF THE DRAWINGS

[0016] In order to complement the description being carried out and with the object of helping to better understand the features of the invention, a sheet of drawings accompanies the present specification as an integrating part thereof which, with an illustrative and non-limiting character, show the following:

Figure 1.- Shows a side elevational view of the object of the invention relating to a machine for manufacturing containers with a consumable content.

Figure 2.- Shows a plan view of the object shown in figure 1.

PREFERRED EMODIMENT OF THE INVENTION

[0017] In view of said figures, it can be seen how the machine for manufacturing containers with a consumable content is constituted as from a train of connected modules, in each one of which a part of the manufacturing process is performed, the modules being integrated on a metallic structure or frame or obtained by aluminum profiles or the like, incorporating four modules (1), (2), (3) and (4), two of which (1) and (2) are feeding modules, module (3) having a dosing application and module (4) is intended to be used as the cutting module.

[0018] The feeding modules (1) and (2) are equal to each other and are located on opposite ends of the machine, they are called feeding modules because they are intended to contain coils (5) and (6) of identical plastic material applied as the raw material for manufacturing the body of the containers, in other words, they contain a plastic sheet intended to form the containers from the use of heat, said coils containing the plastic sheets having a variable band width and the coils rotating by means of respective shafts, incorporating counterweights for braking.

[0019] The coil (5) of plastic material is located in the feeding module (1), the free end of the coil is connected to a conventional pneumatic type feeder (7) that slowly winds it, and which in turn has two components, a mobile one marking the feed, this feed being adjustable, and another fixed one that firmly holds the band.

[0020] Then, there are several nozzles (8) which blow hot air with the object of raising the temperature of the band until reaching a heat stage ranging between 90° C to 100° C, this step being prior to shaping the cavities that will form the containers.

[0021] The nozzles (8) are oriented towards the center of a shaping die (9), provided with two homologous plug tap and socket components, since it is in this area where the suitable temperature must be reached for pressure forming, it being necessary to indicate that by means of actuating a pneumatic cylinder (10) acting on the tonguing and grooving die (9), it definitively shapes the cavity impressed on the previously heated band, forming a determined concave shape logically consistent with the design of the container to be constructed.

[0022] The heat and pressure of a die are combined in this operation and several centering drills are also obtained.

[0023] There are cooling means of the die (9) inside of the feeding module (1) so that the plastic band leaves the module free of heat, being driven by means of rollers of the feeder (7), and in the dosing module (3), the existence of a hopper (11) has been foreseen, inside of which the consumable product is placed, a hopper (11) that is suspended by means of springs and which exhibits vibrating movement with the collaboration of a valve.

[0024] The band of plastic material with the pre-impressed cavities is placed on the lower part, and the hopper is associated with a volumetric dosing apparatus (12) which it feeds, and which consists of a plate having an alternating movement, allowing the precise amount of the product to pass, which falls inside of other hoppers (13) of a lesser volume which, incorporated in a variable number, depending on the cavities impressed on the band, produce the simultaneous filling thereof.

[0025] The invention is provided with an optical scanner (14) intended to carry out the reading of the centering drills made on the band by a shaping die (9), and which at the same time actuates the dosing apparatus (3), specifically the hopper (11), at the right time in order to carry out the correct loading of the cavities.

[0026] The surplus plastic material coming from the coils (5) and (6) of said feed modules (1) and (2) are collected on coils (15) and (16) in the dosing apparatus module (3) for the subsequent recycling thereof, this being possible as a result of respective pneumatic reels (17) and (18) which, due to their low turning torque, keep the bands taut.

[0027] The extraction of these previously mentioned recycling coils (15) and (16) included in the dosing apparatus module is carried out be means of removing the respective pneumatic cylinders (19) and (20), releasing the coils such that the operator can remove them.

[0028] In the feeding module (2) located on the end of the machine diametrically opposite the initial end (1), there is a coil (6) of identical features, and it is associated with another pneumatic feeder (21) provided with two components, a fixed one and another mobile one which shift the band and hold it at the same time.

[0029] The invention has several heating nozzles (22) to aid in shaping the raw material, an actuation that is produced when another shaping die (23), similar to the one situated in the previous feeding module (1), also driven by a pneumatic cylinder (24), comes into action, one or several cavities being impressed on the hot band, which will subsequently be the cavities forming the other half of the container to be formed, exhibiting centering drills.

[0030] The two bands coming from their respective feeding modules (1) and (2), and, therefore, belonging to their corresponding coils (5) and (6), already duly formed as previously stated, and one of them with the impressed cavities filled with the consumable product, are in the so-called cutting module (4) during the last phase of the manufacturing process.

[0031] The invention has suitable means for first permitting both bands to overlap in space and the physical contact thereof to subsequently center them by means of several guiding center points or centering elements

exactly coinciding with said drills made in the bands.

[0032] There is a welding tool or die (25) acting by ultrasound in the fourth cutting module (4), incorporating a die-cutter (26), the parts (25) and (26) being linked by means of a pneumatic cylinder (27) which shifts both of them in a horizontal direction with the aid of several springs for the purpose of inverting the movement, depending on the operation to be carried out.

[0033] The tools or dies (25) and (26) are actuated with the cooperation of the vertically arranged pneumatic cylinder (28), which exerts a strong pressure on the die occupying the suitable position regarding the bands of plastic material, which, as previously described, are centered together at this point and in close physical contact.

[0034] Two consecutive operations are carried out in the cutting module (4), one of them constituting welding by ultrasound of the two halves of the container produced in their respective feeding modules when the weld die or tool (25) is firstly actuated by means of the vertically placed pneumatic cylinder (28), and die cutting the piece when, after the two pneumatic cylinders (28) and (29) are no longer acting, the springs inversely shift the dies, and it is placed in a suitable position to the die cutter (26).

[0035] The vertically placed pneumatic cylinder (28) presses the die and the resulting piece falls into a container through a ramp (29).

[0036] The entire assembly is integrally supported on a preferably metallic structure (30) manufactured in aluminum profiles.

Claims

1. Machine for manufacturing containers with a consumable content, of those intended for manufacturing the container in two halves and subsequently incorporating a consumable content inside of each manufactured container, such as infusions, medicines, vitamins, etc., comprising four modules (1), (2), (3) and (4), the first and second modules (1) and (2) being feeding modules, the third a dosing module (3), and the fourth a cutting module (4), the first two modules (1) and (2) having shaping means for shaping each half of the container, whereas the dosing module (3) fills the obtained container with the consumable product, the cutting module (4) carrying out the sealing and die-cutting of the obtained containers, the four modules (1), (2), (3) and (4) being incorporated on a frame or chassis, and the feeding modules (1) and (2) being identical, incorporating coils (5) and (6) of a thermoplastic material with a variable band width, the coils (5) and (6) being associated with winding and drive means (7) and (21) towards heating devices (8) and (22), which in turn precede the hot forming pressure dies (9) and (23), generating concave forms on the bands of the coils (5) and (6) constituting the half of the containers.

2. Machine for manufacturing containers with a consumable content according to the first claim, **characterized in that** the dosing module (3) has a hopper (11) where the consumable product to be dosed is incorporated, the hopper (11) being provided with a vibrating movement and associated with a dosing apparatus (12) provided with an optical scanner (14), which, once correctly placed with regard to the hopper (11) and to the dosing apparatus (12), one of the bands of thermoplastic material sends a signal to the dosing apparatus (12), which, by means of shifting, collects the consumable product from the hopper (11), placing it in the cavities impressed on the band through an undetermined number of hoppers with reduced dimensions (13).

3. Machine for manufacturing containers with a consumable content according to the first claim, **characterized in that** the cutting module (4) has suitable means for the centering and relative superimposition of the two bands (5) and (6) of thermoplastic material, their respective cavities facing and also containing a welding tool (25) and a cutting die (26), which consecutively act on the bands, the containers with consumable content resulting in said cutting module (4).

Patentansprüche

1. Maschine für die Herstellung von Behältern mit verzehrbarem Inhalt, von der Art, die für die Herstellung des Behälters in zwei Hälften bestimmt sind und die später ins Innere des hergestellten Behälters einen verzehrbaren Inhalt einbringen, wie zum Beispiel Kräutertees, Medikamente, Vitamine, usw., wobei diese Maschine vier Module (1), (2), (3) und (4) aufweist, von denen der erste und der zweite Modul (1) und (2) Zufuhrmodule sind, der dritte ein Dosiermodul (3) und der vierte ein Schneidmodul (4) ist, wobei die ersten beiden Module (1) und (2) Mittel zur Formgebung aufweisen, um die jeweiligen Hälften des Behälters auszubilden, während der Dosiermodul (3) den erhaltenen Behälter mit dem verzehrbaren Produkt füllt, und der Schneidmodul (4) die erhaltenen Behälter versiegelt und stanzt, wobei die vier Module (1), (2), (3) und (4) auf einem Rahmen oder Gestell vorgesehen sind und die Zufuhrmodule (1) und (2) identisch ausgeführt sind und Rollen aus thermoplastischem Material (5) und (6) enthalten, mit einer veränderlichen Bandbreite, wobei die Rollen (5) und (6) mit Wickel- und Führungsmitteln (7) und (21) zu Erwärmungsvorrichtungen (8) und (22) verbunden sind, die ihrerseits vor den mit Druck arbeitenden Warmverfor-

mungsmatrizen (9) und (23) angeordnet sind, und konkave Formen in den Bändern der Rollen (5) und (6) erzeugen, die jeweils eine Hälfte der Behälter bilden.

2. Maschine für die Herstellung von Behältern mit verzehrbarem Inhalt nach Anspruch 1, **dadurch gekennzeichnet, dass** der Dosiermodul (3) einen Trichter (11) aufweist, in dem sich das zu dosierende verzehrbare Produkt befindet, wobei der Trichter (11) eine Rüttelbewegung ausführt und mit einem Dosierer (12) verbunden ist, welcher mit einem optischen Leser (14) ausgestattet ist, welcher, sobald eines der Bänder aus thermoplastischem Material ordnungsgemäß in Bezug auf den Trichter (11) und den Dosierer (12) angeordnet ist, dem Dosierer (12) ein Signal sendet, der daraufhin durch eine Verschiebung das verzehrbare Produkte aus dem Trichter (11) entnimmt, und es über eine unbestimmte Anzahl von Trichtern mit kleinen Abmessungen (13) auf den in dem Band eingebrachten Vertiefungen ablegt.

3. Maschine für die Herstellung von Behältern mit verzehrbarem Inhalt nach Anspruch 1, **dadurch gekennzeichnet, dass** der Schneidmodul (4) über geeignete Mittel für ein Zentrieren und eine relative Überlagerung der beiden Bänder (5) und (6) aus thermoplastischem Material verfügt, damit die jeweiligen Vertiefungen gegenübergestellt werden, wobei dieser Modul außerdem ein Schweißwerkzeug (25) und ein Stanzmesser (26) aufweist, die nacheinander auf die Bänder einwirken, wodurch in diesem Schneidmodul (4) die Behälter mit verzehrbarem Inhalt entstehen.

Revendications

1. Machine pour la fabrication de contenants à un contenu consommable, du type destiné à la fabrication du contenant en deux moitiés en incorporant ensuite à l'intérieur de chaque contenant fabriqué un contenu consommable, comme il est le cas des infusions, des médicaments, des vitamines, etc., en comprenant quatre modules (1), (2), (3) et (4), le premier et le deuxième modules (1) et (2) étant des modules d'alimentation, le troisième module (3) étant un module de dosage, et le quatrième module (4) étant un module de découpage, les deux premiers modules (1) et (2) présentant des moyens de configuration pour configurer chaque moitié du contenant, tandis que le module de dosage (3) remplit le contenant obtenu du produit consommable, le module (4) de découpage effectuant le scellage et le matriçage des contenants obtenus, les quatre modules (1), (2), (3) et (4) étant incorporés sur un bâti ou châssis, et les modules d'alimentation (1) et (2) étant identiques, en incorporant des bobines de matière thermoplastique (5) et (6) avec une largeur de bande variable, les bobines (5) et (6) étant associées à des moyens de bobinage et conduite (7) et (21) vers des dispositifs (8) et (22) de réchauffement, qui à leur tour précèdent les matrices de façonnage à chaud par pression (9) et (23), en générant des formes concaves sur les bandes des bobines (5) et (6) constitutives de la moitié des contenants.

2. Machine pour la fabrication de contenants à contenu consommable, selon la première revendication, **caractérisée en ce que** le module de dosage (3) présente une trémie (11) dans laquelle se trouve incorporé le produit consommable à doser, la trémie (11) étant pourvue d'un mouvement vibratoire, et celle-ci étant associée à un doseur (12) pourvu d'un lecteur optique (14), lequel, une fois situé correctement par rapport à la trémie (11) et au doseur (12), une des bandes de matière thermoplastique, envoie un signal au doseur (12), qui au moyen d'un déplacement reçoit de la trémie (11) le produit consommable, en le déposant dans les cavités gravées dans les bandes, à travers un nombre indéterminé de trémies à dimensions réduites (13).

3. Machine pour la fabrication de contenants à contenu consommable, selon la première revendication, **caractérisée en ce que** le module de découpage (4) dispose de moyens adéquats pour le centrage et la superposition relative des deux bandes (5) et (6) de matière thermoplastique, en mettant en regard leurs cavités respectives et en contenant en outre un outil (25) de soudage et une matrice (26) de découpage, qui agissent consécutivement sur les bandes, en ayant pour résultat sur ledit module (4) de découpage, les contenants à contenu consommable.

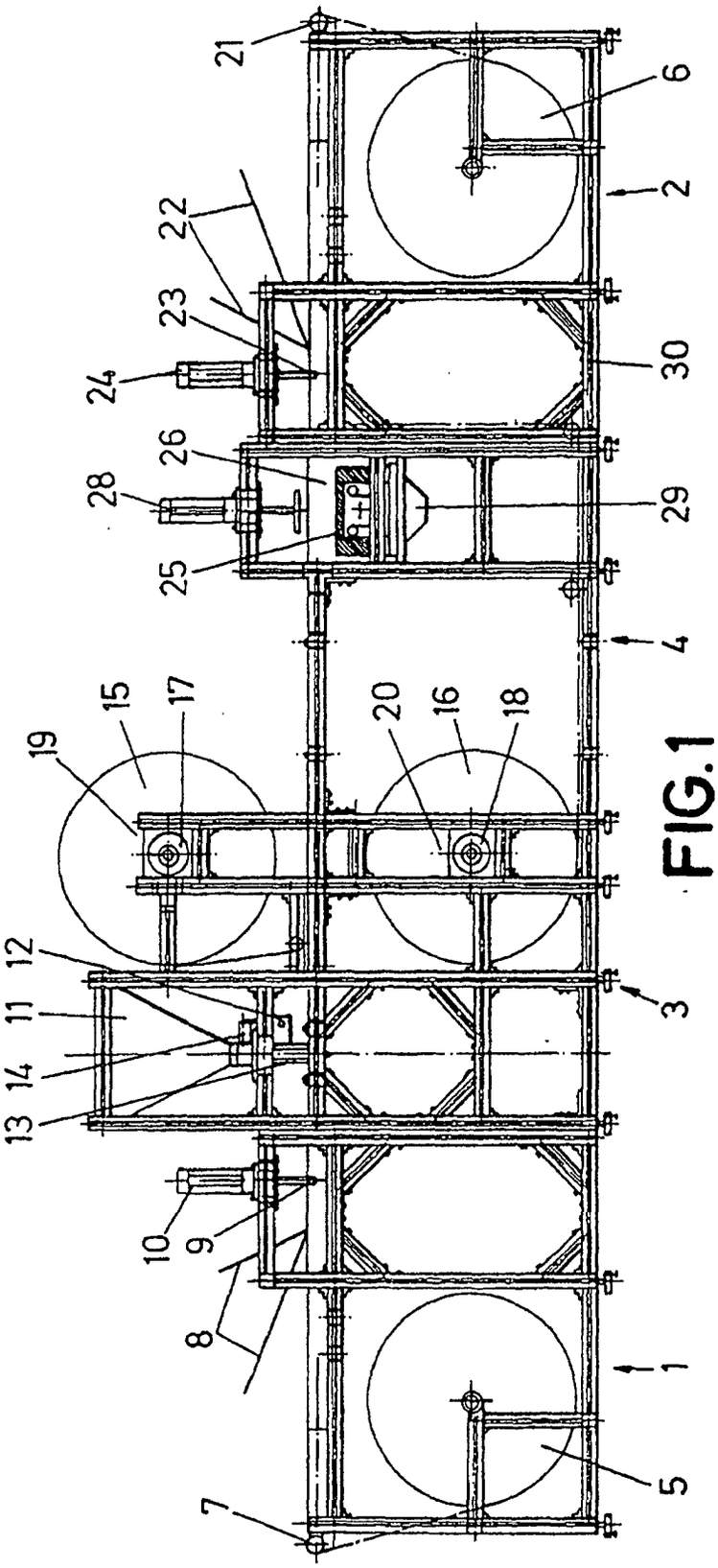

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FIG.1

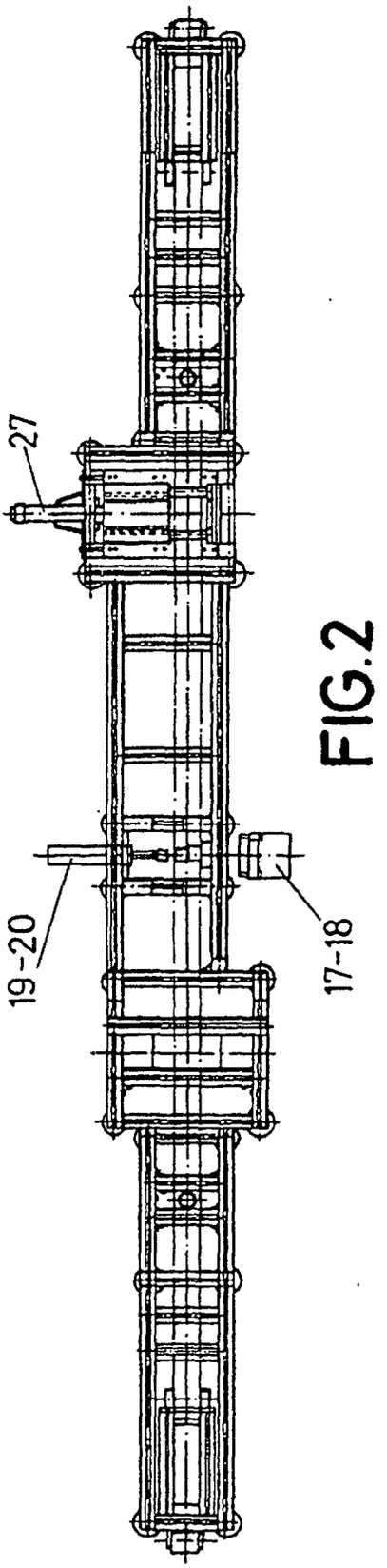

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FIG.2